

Sustainability and Street Lights in Asheville, NC



Kerby Smithson
Office of Sustainability
City of Asheville

October 1st, 2014
2014 National Safety Rest
Area Conference



Helping to Preserve the City of Asheville for Future Generations

Sustainability and Street Lights



Outline

My background

Asheville's Sustainability History and Performance

- **Carbon Footprint**
- **Energy Spending**
- **Projects**

The next frontier: The Community

LED Street Lighting

My background



My background

- BS Environmental Technology from NCSU
- Peace Corps volunteer in Bolivia 2006-2008
- MS Sustainable Systems University of Michigan
- Working at City of Asheville since Fall 2011



Asheville Sustainability History



Sustainability Timeline

- **Created a Citizen Sustainability Committee: 2007**
- **Established the Office of Sustainability: 2008**
- **All new city buildings will be LEED certified: 2008**
 - *First completed building: 2011**
- **Adopted Sustainability Management Plan: 2009**
- **Carbon footprint reduction policy of 2% per year: 2008**
 - * Doubled it to 4% per year: 2011**

Asheville Sustainability History

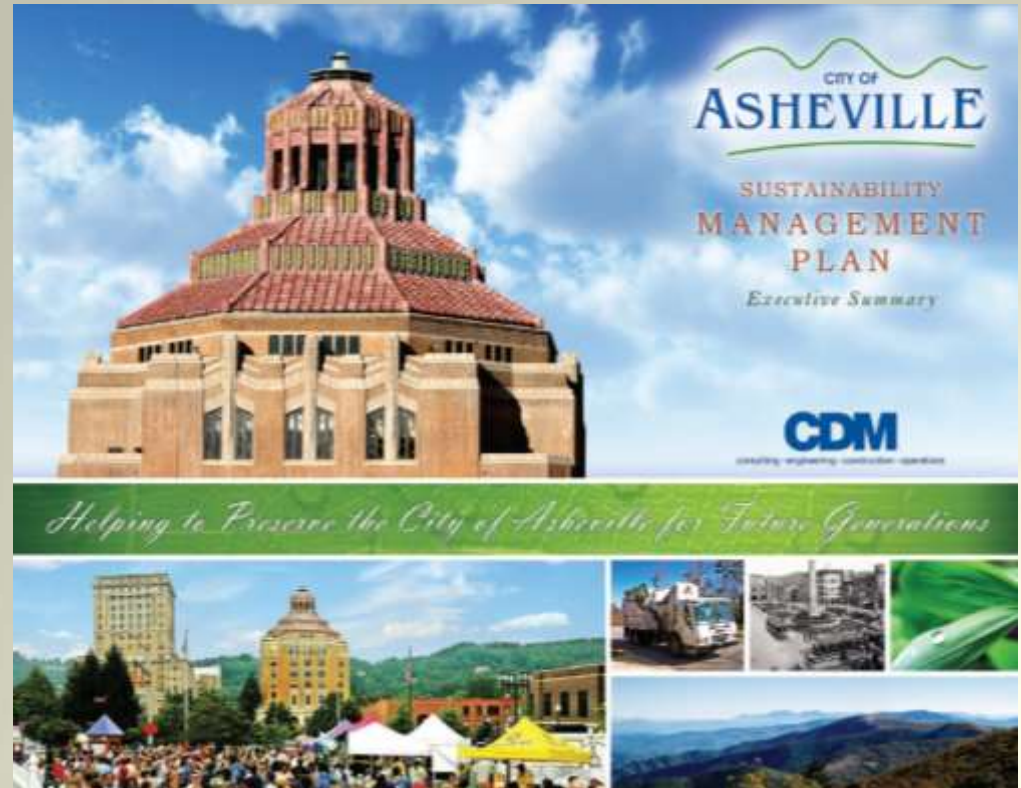


Sustainability Management Plan Adopted 2009

- 8 Focus Areas
- 16 Goal Areas
- 107 Action Items

FOCUS AREAS

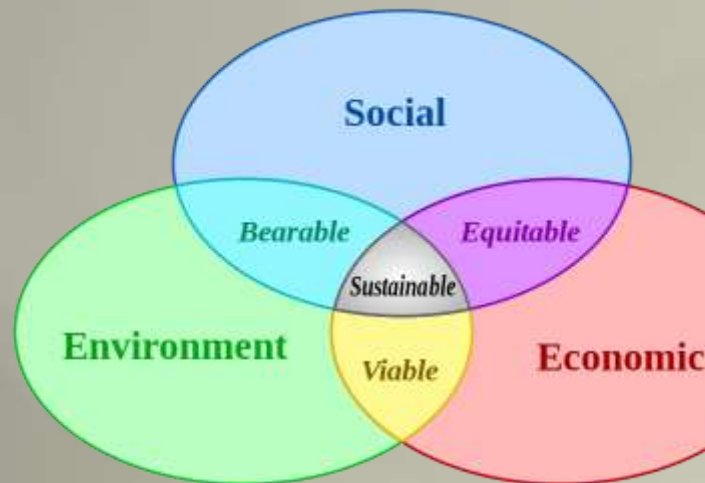
- Water
- Transportation
- Solid waste
- Buildings
- Land use planning
- Communication
- GHG reduction
- Management practices



Asheville Sustainability History



Triple Bottom Line Thinking



Look familiar?



Performance: Carbon Footprint



What kinds of City Government activities do we track in our carbon footprint?

Electricity in buildings and parks

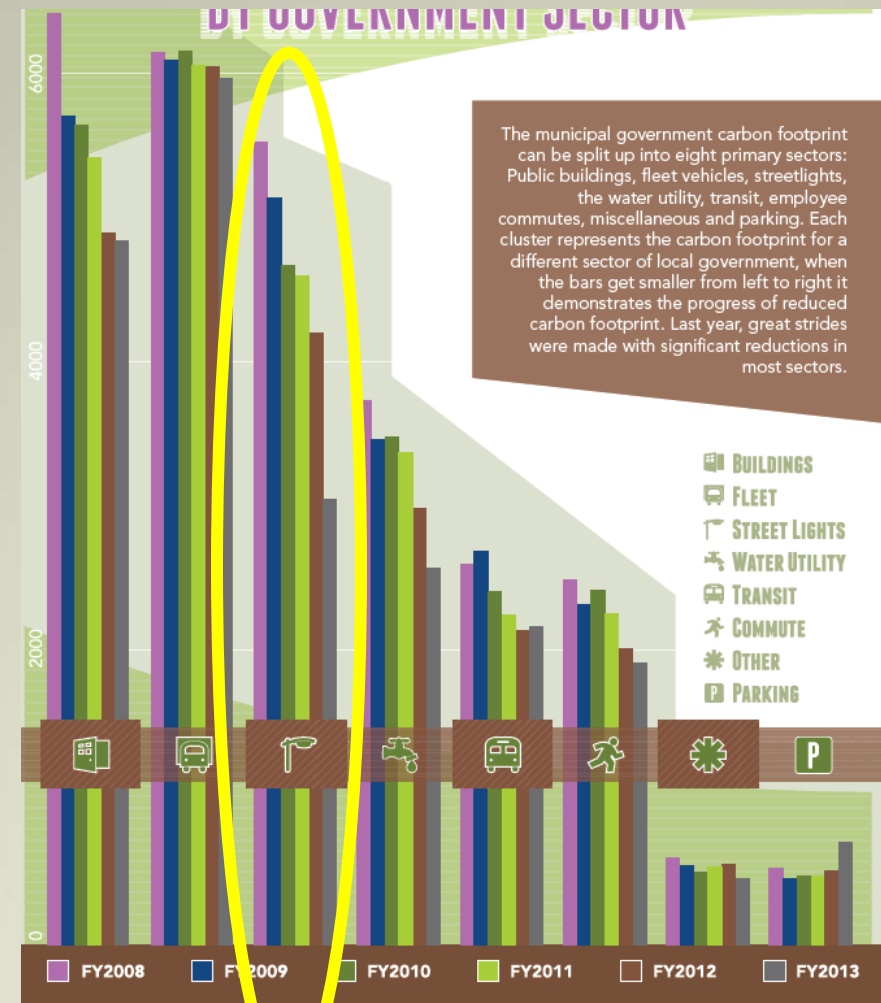
Natural gas in buildings

Diesel, gasoline and CNG vehicle fuel

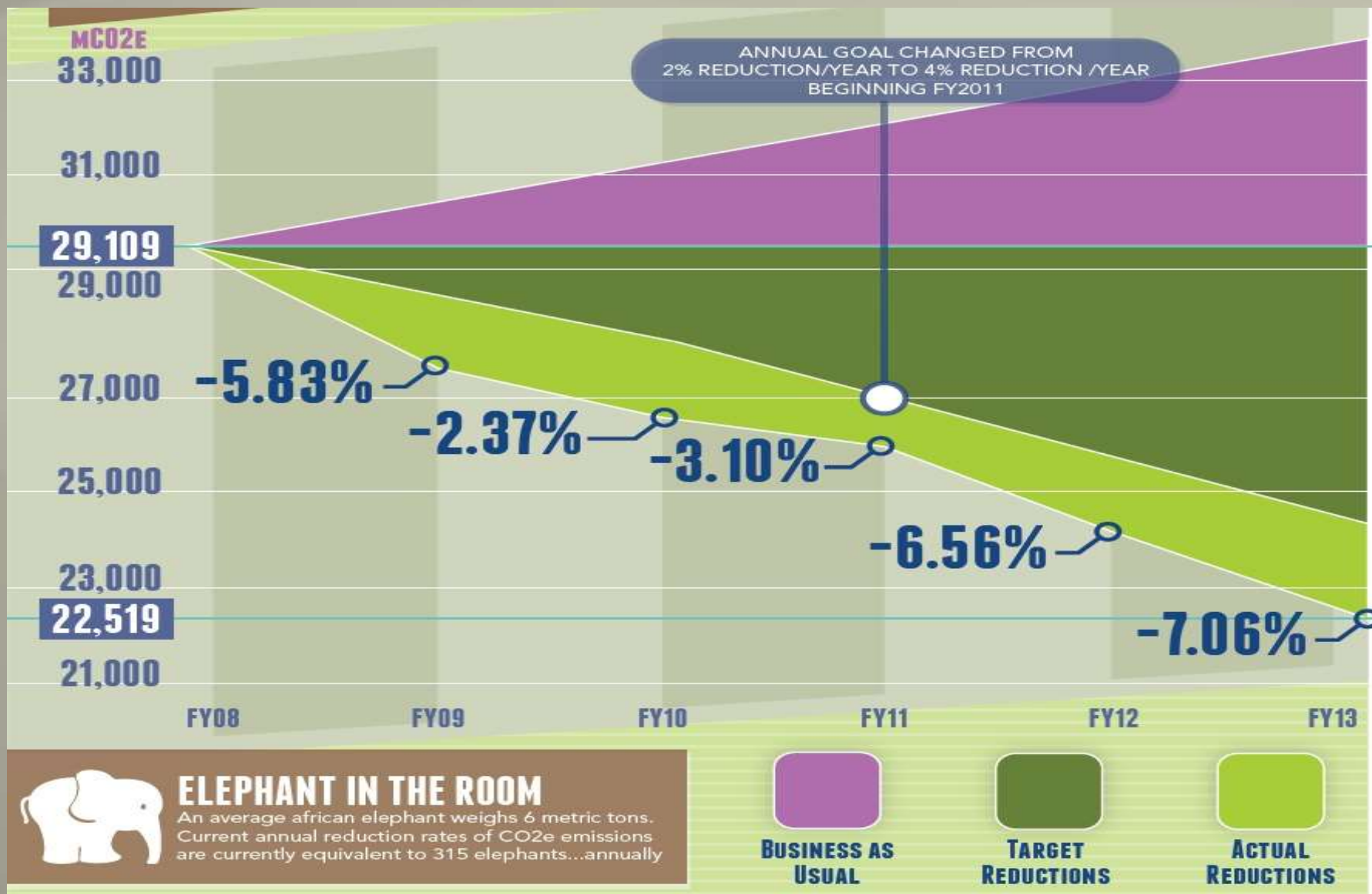
Employee commuting

Streetlights

Water production and distribution



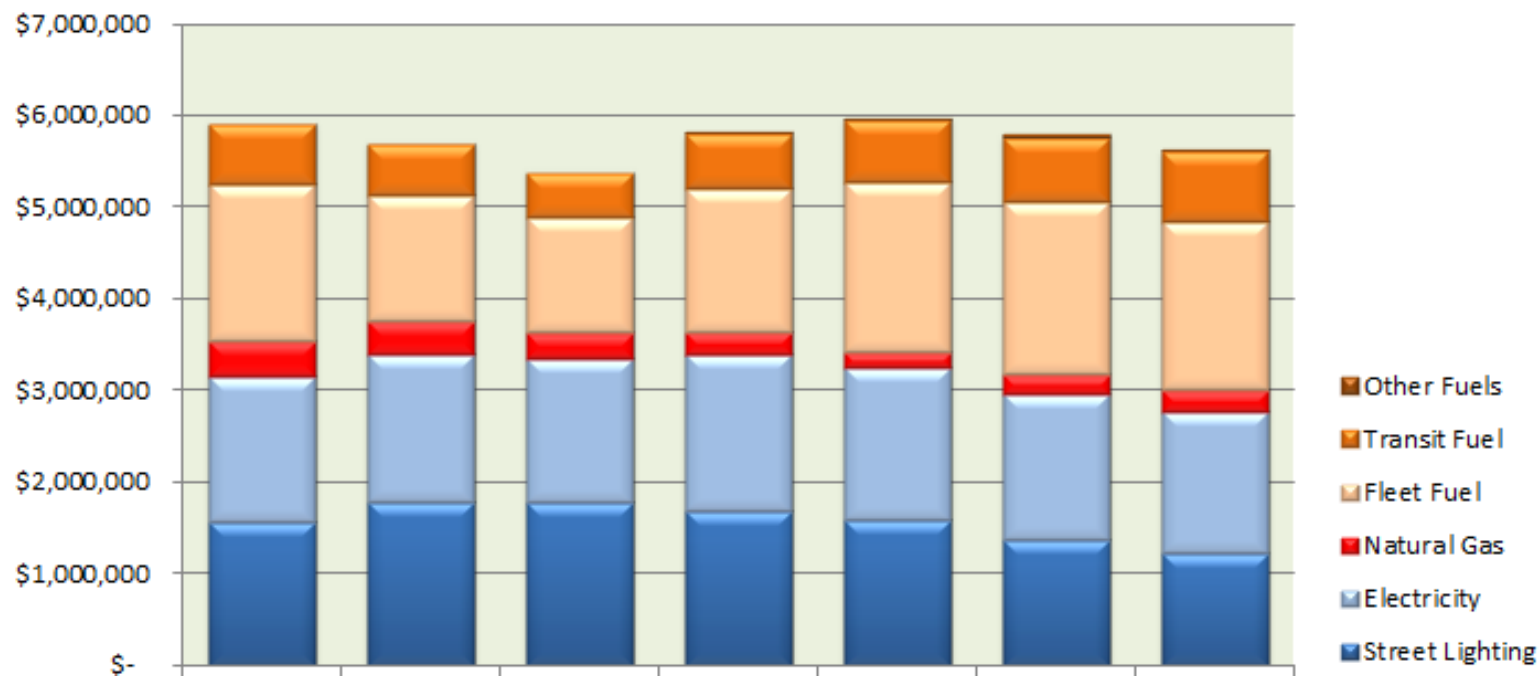
Performance: Carbon Footprint



Performance: Energy Spending



Total Energy Spending 2008-14



	FY 08	FY 09	FY 10	FY 11	FY 12	FY 13	FY 14
Other Fuels	\$-	\$-	\$-	\$16,205	\$27,872	\$42,679	\$21,497
Transit Fuel	\$669,606	\$558,618	\$486,435	\$586,768	\$687,102	\$699,624	\$757,114
Fleet Fuel	\$1,711,852	\$1,375,904	\$1,257,193	\$1,561,667	\$1,839,336	\$1,870,531	\$1,842,406
Natural Gas	\$384,934	\$368,326	\$279,477	\$256,619	\$177,137	\$218,813	\$243,789
Electricity	\$1,571,077	\$1,600,424	\$1,584,959	\$1,703,841	\$1,671,646	\$1,590,755	\$1,549,969
Street Lighting	\$1,567,730	\$1,783,290	\$1,767,209	\$1,681,719	\$1,574,068	\$1,368,292	\$1,211,770
TOTAL	\$5,905,199	\$5,686,562	\$5,375,274	\$5,806,819	\$5,977,161	\$5,790,694	\$5,626,546

Projects: Vehicles



**Solar electric vehicle
charging station**



CNG Fueling Station



Driver fuel conservation education



B-20 Biodiesel

Projects: Buildings



City Hall lighting retrofit



Fire Station improvements



T12 Lighting Replacements



Parking Deck LED Lighting

Looking ahead: Community

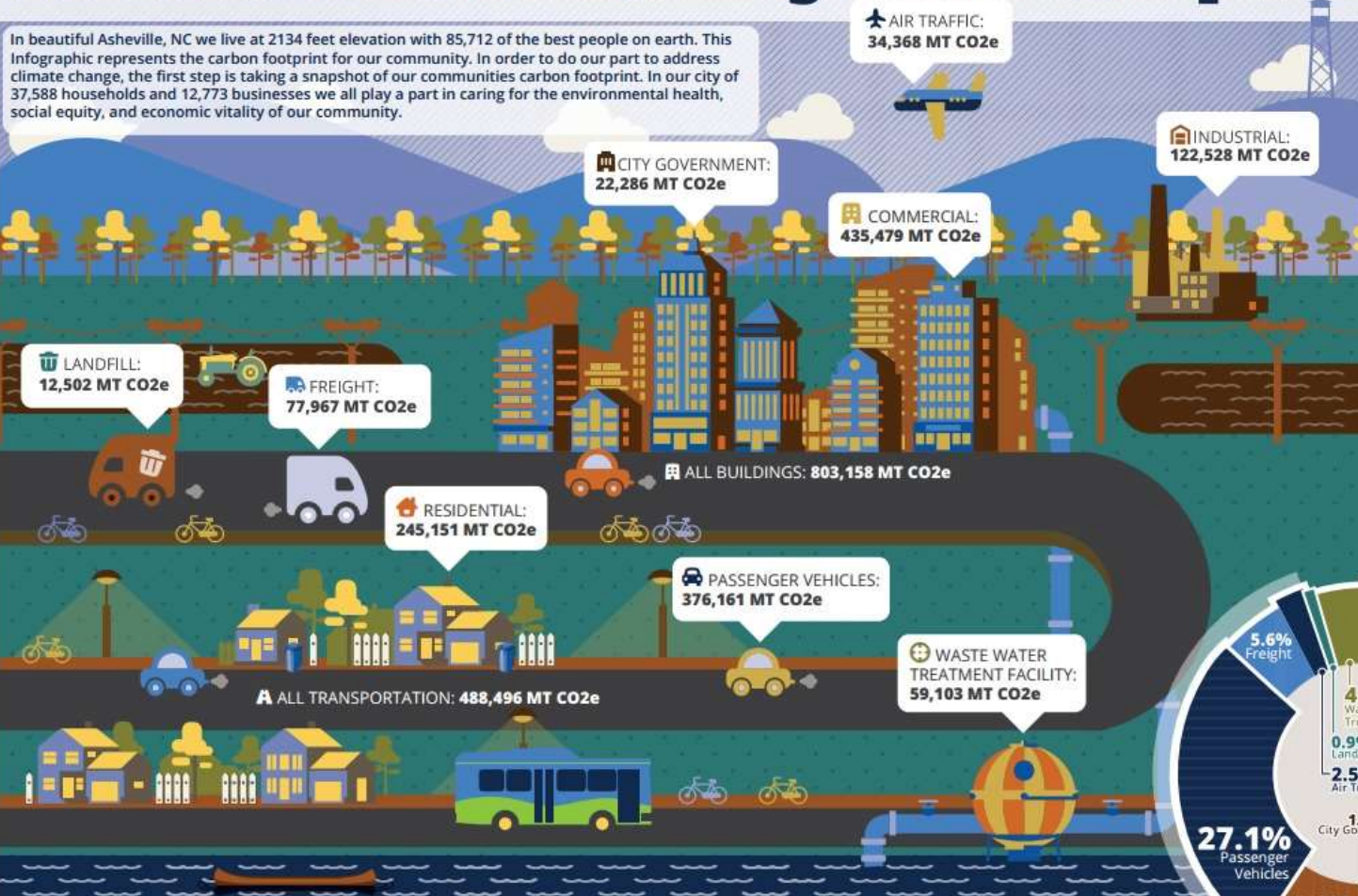


Looking ahead: Community



2012 Asheville Community Carbon Footprint

In beautiful Asheville, NC we live at 2134 feet elevation with 85,712 of the best people on earth. This Infographic represents the carbon footprint for our community. In order to do our part to address climate change, the first step is taking a snapshot of our communities carbon footprint. In our city of 37,588 households and 12,773 businesses we all play a part in caring for the environmental health, social equity, and economic vitality of our community.



GOOD NEWS

1,307,238
Annual transit riders

16.9 miles
Bike lanes on the road

22
Electric vehicle charging stations

283
Energy Star Buildings

8
Farmers Markets

4.3 miles
Greenway

274
Healthy Built Homes

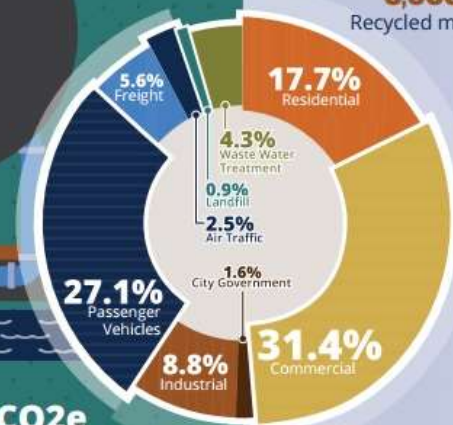
794
Hybrid vehicles

31
LEED-Certified buildings

317,132 gallons
Locally produced biodiesel

752 acres
Public open space

6,000 tons
Recycled materials



TOTAL: 1,385,546 CO₂e



* Carbon footprint is measured in the metric tons of carbon dioxide equivalent abbreviated MT CO₂e
 * Emissions calculated according to ICLEI's US Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions, 2012
 * The treatment of drinking water is included in the City government sector
 * Data provided by Duke Energy Progress, PSNC Energy, City of Asheville, Buncombe County, Asheville Airport Authority, NC Department of Transportation and Metropolitan Sewerage District
 * Questions or comments, visit www.ashevillenc.gov/green

Looking ahead: Community



What's on the horizon?

- **Composting collection**
- **More bike lanes, greenways and pedestrian improvements**
- **More alternative vehicle infrastructure**
- **Sustainable economic development incentives**
- **Renewable energy generation – both utility scale and decentralized**
- **Better mass transit**
- **Community waste reduction goal**
- ...

Projects: Street Lights



- **LED Street Light replacement began in FY2011**



- **9,700 out of ~10,000 lights replaced so far**

Replacement Program Snapshot



Total fixtures targeted 9,700

Project Costs \$2.5 M

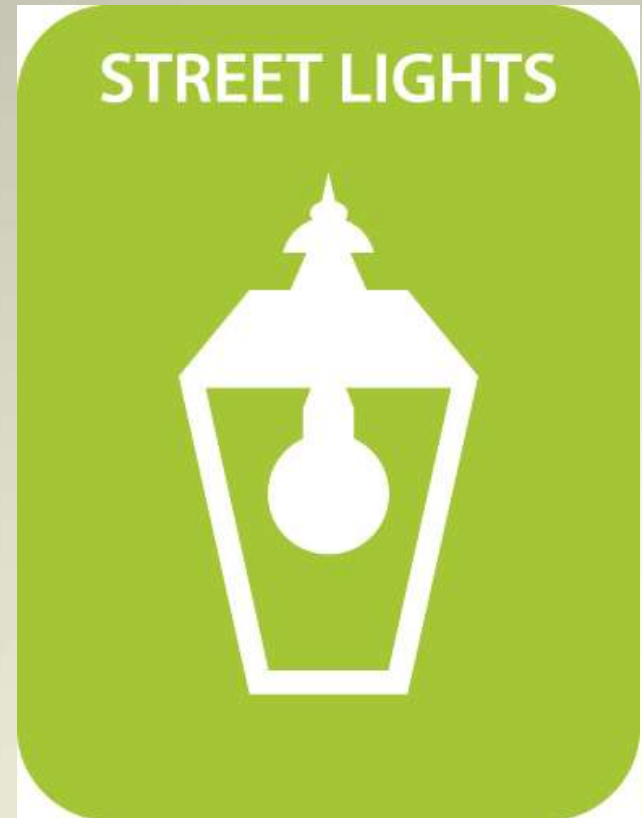
Energy Budget \$1.75 M

Annual Savings >\$450,000

Energy Savings 43% less

Return on Investment 4.8 years

CO2 Reduction 6.2%



LED Street Lights



Duke Energy Progress, Inc.
(North Carolina Only)

L-4

STREET LIGHTING SERVICE SCHEDULE SLS-26

II. Overhead Service to Light Emitting Diode (LED) Lighting

The basic rate per fixture defined below will be billed for installations of PEC-approved lighting fixtures installed on Company's system distribution poles. Upon notification by Customer that 35% or greater of the light emitting diodes contained within the fixture are not burning, Company will perform as soon as practicable, during regular working hours, the necessary maintenance to restore illumination. The basic rate does not include the monthly charges for additional facilities, special lighting poles or posts, underground service, or any contribution required under this Schedule.

A. LED Basic Rate (Standard Option):

<u>Fixture</u>	<u>Monthly Charge Per Fixture*</u>	<u>Monthly kWh Per Fixture</u>
LED 75	\$6.42	25
LED 105	9.20	35
LED 215	13.54	73
LED 205 Site Lighter	13.59	69

* In addition to the Basic Rate, Customer shall pay a monthly charge of 1.3% times the cost difference between the estimated installed cost of a PEC-approved fixture and the basic LED fixture cost allowance for the stated lumen category in accordance with the ADDITIONAL FACILITIES paragraph below. The monthly charge shall not be less than zero.

B. LED Basic Rate (Customer-Ownership Option): Customer shall provide a PEC-approved LED fixture at no cost to Company for installation on Company's system distribution poles. Customer retains full ownership of the fixture and after removal from service will be picked up by the Customer. The basic rate defined below will be billed for installation, operation and maintenance of Customer-owned lighting fixture. Customer shall provide a replacement fixture, if required, to maintain the lighting service.

<u>Fixture</u>	<u>Monthly Charge Per Fixture</u>	<u>Monthly kWh Per Fixture</u>
LED 75	\$5.59	25
LED 105	6.07	35
LED 215	7.72	73
LED 205 Site Lighter	7.55	69

- Asheville participates in DEP's Customer-Owned LED rate
- DEP still owns poles, wires, and arms, but City purchases and owns LED fixtures – DEP still provides maintenance
- Allows City to leverage ability to borrow money cheaply for the project to save money long term

Replacement Program Timeline

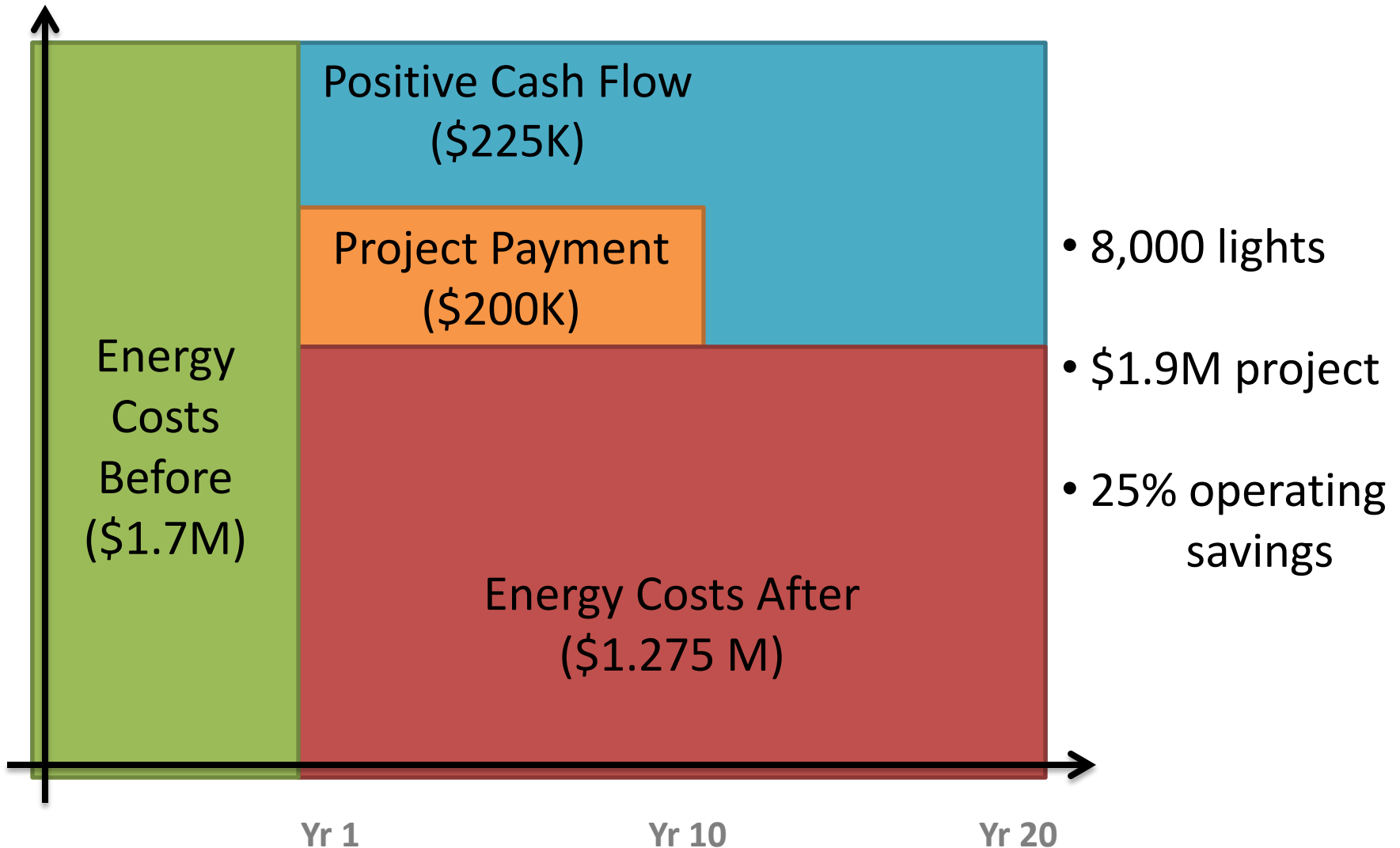


Installation Phase Approach

1. 700 fixtures pilot phase, 2 month install period (2011)
2. 3,500 fixtures, 5 month install (2012)
3. 4,000 fixtures, 4 month install (2013)
4. 1,500 fixtures, 3 month install (2014)

Future: company-owned 50,000+ lumen fixtures and decorative fixtures

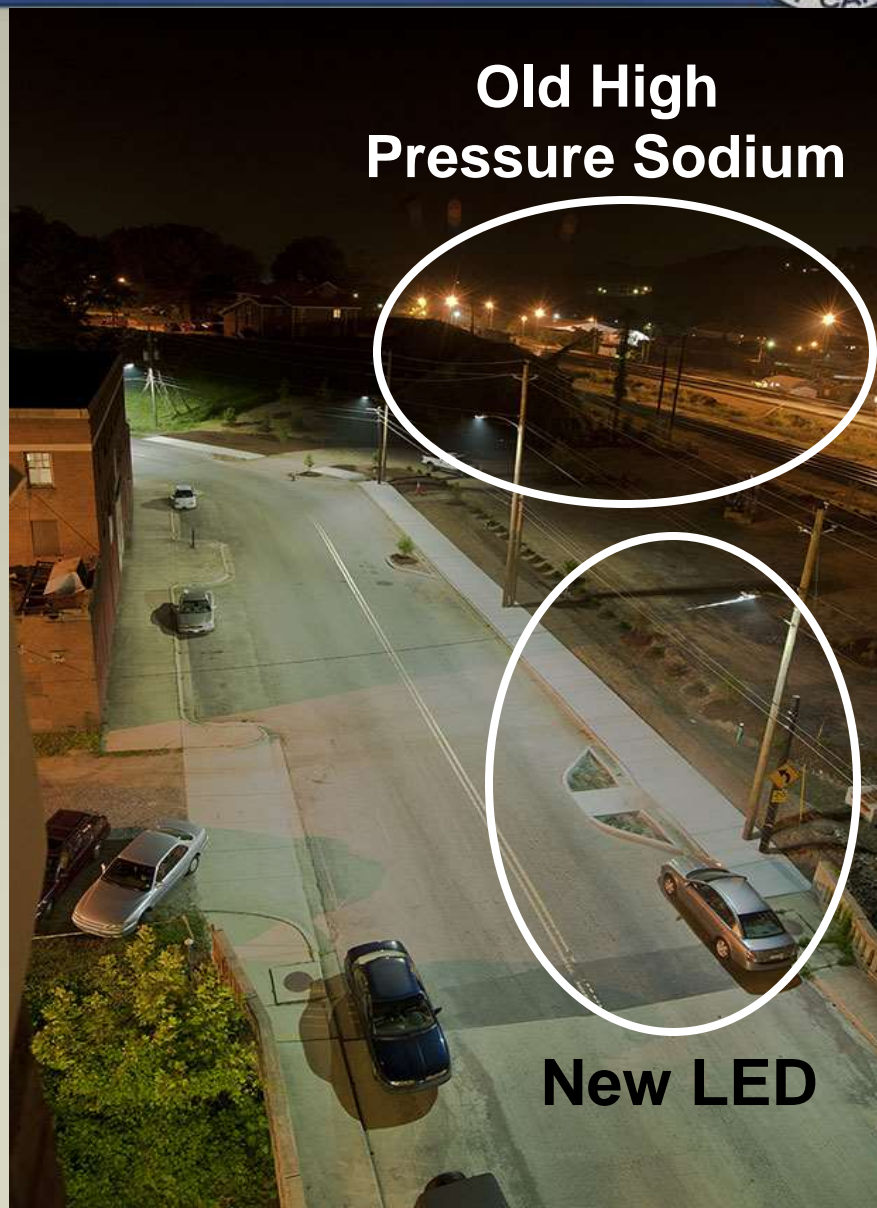
Asheville LED Streetlights Financial Model



Fixture Info



- 4,200 Beta fixtures (now Cree)
- 5,500 Leotek fixtures
- 4300K color temp
- 80% upgraded 9500 lumen HPS to 75 watt LED
- 10 year warranty
- Initial failure rate ~0.1%



Fixture Info



Cree LEDWay



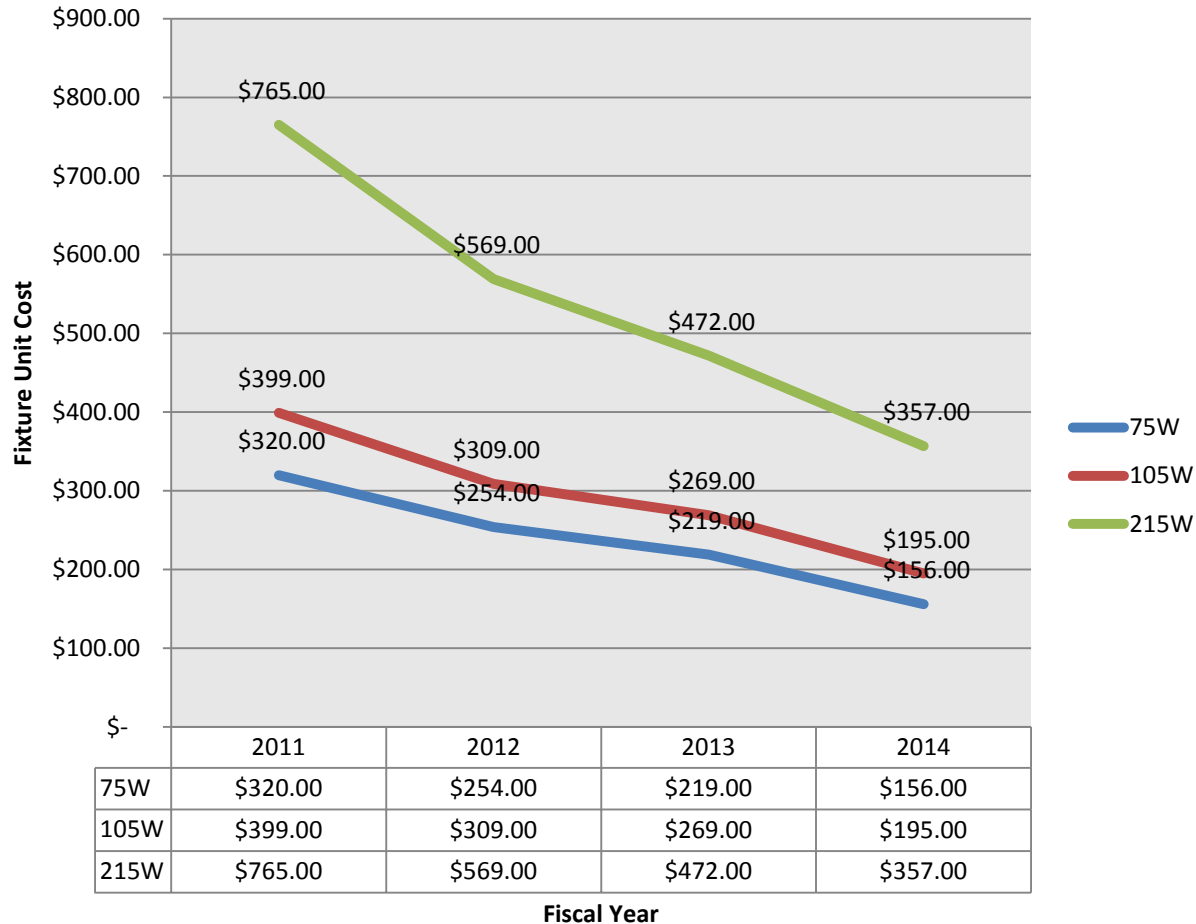
**Leotek Green
Cobra**

We only replaced “cobrahead” fixtures, no decorative styles

Technology Price Change



Asheville LED Fixture Purchase Prices



Over 3 Years

- 52% average price drop

- ROI dropped by 1.4 yrs

Customer Service Perspective



9,700 LED fixtures city wide

~200 complaints; 2% streetlight complaint rate

Most complaints can be solved with shielding



#1 Complaint= TOO BRIGHT

Despite complaints, many residents LOVE the new lights and want MORE of them

Thank You!



Kerby Smithson

Office of Sustainability

City of Asheville

ksmithson@ashevillenc.gov

www.AshevilleNC.gov/green

828.251.4057

